

Title (en)
METHOD FOR CRUSHING CELL

Title (de)
VERFAHREN ZUM ZERKLEINERN VON BATTERIEN

Title (fr)
PROCEDE DE BROUAGE DE PILES

Publication
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Application
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Abstract (en)
This invention provides a safe and efficient method of dismantling used lithium ion batteries. More specifically, the plastic cases which protect sealed battery cells are removed from the system in a stable and reliable fashion. Valuable materials such as lithium cobalt oxide, an oxide of a lithium-transition metal compound, aluminum and copper must be separated and recovered. The invention is distinguished by the fact that it entails the following processes. In the crushing process, the batteries are chilled to a temperature of -50 DEG C or lower. In this state they are repeatedly subjected to vibration and pressure by a number of objects whose rigidity and specific gravity are greater than those of the plastic. In this way the batteries are separated into sealed battery cells and plastic cases. In the heating process, the sealed battery cells separated in the process are heated to a temperature of at least 200 DEG C in a non-oxidizing atmosphere to separate mainly the organic materials. Finally, in one or more separation processes, the useless materials are removed and the targeted valuable materials are separated in a sequential fashion from the crushed fragments produced in the crushing process. <IMAGE>

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Cited by
GB2424651A; CN110233303A; CZ302457B6; EP2975686A1; EP3836288A1; US11482737B2; WO2010149611A1; WO2024003541A1; EP2450991A1

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